

CLAIMS

1. A resin coated metal sheet in which a magnetic coating film containing a magnetic powder is coated to a thickness from 3 to 50 μm at least on one surface of a metal sheet.
2. The resin coated metal sheet according to claim 1, wherein the magnetic powder is a soft magnetic ferrite powder.
3. The resin coated metal sheet according to claim 2, wherein the magnetic powder is a magnetic metal powder.
4. The resin coated metal sheet according to claim 1, wherein a resin constituting the magnetic coating film is a polyester resin.
5. The resin coated metal sheet according to claim 1, wherein the magnetic coating film further contains from 20 to 40% of an electrically conductive additive and the thickness of the magnetic coating film is from 3 to 15 μm .
6. The resin coated metal sheet according to claim 5, wherein a total content of the electrically conductive additive and the magnetic powder in the magnetic coating film is from 30 to 60%.

7. The resin coated metal sheet according to claim 1, which satisfies the following (1) or (2) and satisfies the following (3):

(1) the magnetic coating film described above which is a heat releasing magnetic film having a heat releasing property is coated on one surface of the metal sheet and a heat releasing coating film of a thickness of 1 μm or more is coated on another surface of the metal sheet,

at least one of the heat releasing magnetic coating film and the heat releasing coating film contains 1% or more of carbon black, and

the coating film not containing carbon black contains 10% or more of heat releasing additives other than carbon black:

(2) the magnetic coating film which is a heat releasing magnetic coating film having a heat releasing property is coated on both surfaces of the metal sheet,

the heat releasing magnetic coating film on at least one surface containing 1% or more of carbon black,

the coating film not containing carbon black contains 10% or more of heat releasing additives other than carbon black:

(3) an integrated emissivity of infrared rays (wavelength: 4.5 to 15.4 μm) when heating the resin coated metal sheet to

100°C can satisfy the following formula (1):

$$a \times b \geq 0.42 \dots \text{formula (1)}$$

a: integrated infrared ray emissivity at one surface of the resin coated metal sheet.

b: integrated infrared ray emissivity at another surface of the resin coated metal sheet.

8. The resin coated metal sheet according to claim 7, wherein an average particle size of carbon black is from 5 to 100 nm.

9. The resin coated metal sheet according to claim 1, which can satisfy the following formula (1) or (2) and satisfy the following (3):

(1) the magnetic coating film described above which is a heat releasing magnetic film having a heat releasing property is coated on one surface of the metal sheet and a heat releasing coating film of a thickness of 1 μm or more is coated on another surface of the metal sheet

at least one of the heat releasing magnetic coating film and the heat releasing coating film contains 30% or more of titanium oxide, and

the coating film not containing titanium oxide contains 1% or more of heat releasing additives other than titanium oxide:

(2) the magnetic coating film which is a heat releasing magnetic coating film having a heat releasing property is coated on both surfaces of the metal sheet,

at least one of the heat releasing magnetic coating films contains 30% or more of titanium oxide,

the coating film not containing titanium oxide contains 1% or more of heat releasing additives other than titanium oxide:

(3) an integrated emissivity of infrared rays (wavelength: 4.5 to 15.4 μm) when heating the resin coated metal sheet to 100°C can satisfy the following formula (1):

$$a \times b \geq 0.42 \dots \text{formula (1)}$$

a: infrared-ray integrated emissivity at one surface of the resin coated metal sheet.

b: infrared-ray integrated emissivity at another surface of the resin coated metal sheet.

10. The resin coated metal sheet according to claim 1, which can satisfy the following (1) or (2) and satisfy the following (3):

(1) a first surface of the metal sheet is coated with the magnetic coating film and a second surface on a side opposite to the first surface is coated with a heat releasing film of 1 μm or more:

the heat releasing coating film contains 1% or more of

heat releasing additives, and

the magnetic coating film selectively further contains 1% or more of heat releasing additives:

(2) both surfaces of the metal sheet are coated each with the magnetic coating film:

the magnetic coating film at the first surface of the metal sheet selectively contains 1% or more of heat releasing additive, and

the magnetic coating film at the second surface on the side opposite to the first surface contains 1% or more of heat releasing additives:

(3) an integrated emissivity of infrared rays (wavelength: 4.5 to 15.4 μm) when heating the resin coated metal sheet to 100°C can satisfy the following formulae (2) and (3):

$$b \leq 0.9 (a-0.05) \quad \text{formula (2)}$$

$$(a-0.05) \times (b-0.05) \geq 0.08 \quad \text{formula (3)}$$

a: integrated infrared ray emissivity at the second surface of the resin coated metal sheet.

b: integrated infrared ray emissivity at the first surface of the resin coated metal sheet.

11. The resin coated metal sheet according to claim 1, which can satisfy the following (1) or (2) and satisfy the following (3) and (4):

(1) one surface of the metal sheet is coated with the

magnetic coating film, the magnetic coating film selectively containing black additives, a resin coating film containing at least one of a white pigment and a luster pigment is coated selectively on the magnetic coating film containing the black additives:

another surface of the metal sheet is coated with a black coating film containing black additives and a resin coating film containing at least one of a white pigment and a luster pigment:

(2) both surfaces of the metal sheet are coated each with the magnetic coating film,

the magnetic coating on at least one surface is a black magnetic coating film containing black additives,

a resin coating film comprising at least one of a white pigment and a luster pigment is coated on the black magnetic coating film, and

another surface is selectively coated with a resin coating film containing at least one of a white pigment and a luster pigment:

(3) a thickness of each of the resin coating films is from 0.05 to 10 μm and an addition amount of the white pigment and the luster pigment contained in the resin coating film is from 1 to 25% in total:

(4) a color of a resin coated metal sheet with addition of a white pigment and a luster pigment can satisfy an L value

from 44.0 to 60.0 as measured by a color difference meter (SZS-Σ90) manufactured by Nippon Denshoku Industries Co., Ltd.

12. The resin coated metal sheet according to claim 11, wherein at least one of the white pigment and the luster pigment contained in the resin film is an oxide pigment.

13. The resin coated metal sheet according to claim 11, wherein at least one of the white pigment and the luster pigment contains titanium oxide.

14. The resin coated metal sheet according to claim 1, which can satisfy the following (1) or (2) and satisfy the following (3) to (5), wherein

(1) one surface of the metal sheet is coated with the magnetic coating film which is a heat releasing magnetic coating film having a heat releasing property, the heat releasing magnetic coating film selectively contains black additives and, in a case where the heat releasing magnetic coating paint contains the black additives, a resin coating film containing at least one of a white pigment and a luster pigment is further coated selectively,

another surface of the metal sheet is coated with a heat releasing coating film of 1 μm or more and a resin coating film containing at least one of a white pigment and a

luster pigment,

at least one of the heat releasing magnetic coating film and the heat releasing coating film contains 1% or more of carbon black, and

a surface not containing carbon black contains 10% or more of heat releasing additives:

(2) both surfaces of the metal sheet are coated with the magnetic coating film which is a heat releasing magnetic coating film having a heat releasing property,

at least one surface of the heat releasing magnetic coating film contains 1% or more of carbon black, and

a surface not containing carbon black contains 10% or more of heat releasing additives, and

a resin coating film containing at least one of a white pigment and a luster pigment is coated further over the heat releasing magnetic resin film on at least one surface:

(3) an integrated emissivity of infrared rays (wavelength: 4.5 to 15.4 μm) when heating the resin coated metal sheet to 100°C can satisfy the following formula (1):

$$a \times b \geq 0.42 \dots \text{formula (1)}$$

a: integrated infrared ray emissivity at one surface of the resin coated metal sheet.

b: integrated infrared ray emissivity at another surface of the resin coated metal sheet:

(4) a thickness of the resin coating film is from 0.5 to 10

μm , and an addition amount of the white pigment and the luster pigment contained in the resin coating film is from 1 to 25% in total:

(5) a color of a resin coated metal sheet with addition of a white pigment and a luster pigment can satisfy an L value from 44.0 to 60.0 as measured by a color difference meter (SZS-Σ90) manufactured by Nippon Denshoku Industries Co., Ltd.

15. The resin coated metal sheet according to claim 14, wherein an average particle size of the carbon black is from 5 to 100 nm.

16. The resin coated metal sheet according to claim 1, which can satisfy the following (1) or (2) and satisfy the following (3) to (5), wherein

(1) one surface of the metal sheet is coated with the magnetic coating film which is a heat releasing magnetic coating film having a heat releasing property, the heat releasing magnetic coating film selectively contains black additives and, in a case where the heat releasing magnetic coating paint contains the black additives, a resin coating film containing at least one of a white pigment and a luster pigment is further coated selectively,

another surface of the metal sheet is coated with a heat releasing coating film of 1 μm or more and a resin

coating film containing at least one of a white pigment and a luster pigment,

at least one of the heat releasing magnetic coating film and the heat releasing coating film contains 30% or more of titanium oxide, and

a surface not containing titanium oxide contains 1% or more of heat releasing additives:

(2) both surfaces of the metal sheet are coated with the magnetic coating film which is a heat releasing magnetic coating film having a heat releasing property,

at least one of the heat releasing magnetic coating films contains 30% or more of titanium oxide, and

a surface not containing titanium oxide contains 1% or more of heat releasing additives, and

a resin coating film containing at least one of a white pigment and a luster pigment is coated further over the heat releasing magnetic resin film on at least one surface:

(3) an integrated emissivity of infrared rays (wavelength: 4.5 to 15.4 μm) when heating the resin coated metal sheet to 100°C can satisfy the following formula (1):

$$a \times b \geq 0.42 \dots \text{formula (1)}$$

a: integrated infrared ray emissivity at one surface of the resin coated metal sheet.

b: integrated infrared ray emissivity at another surface of the resin coated metal sheet:

(4) a thickness of each of the resin coating films is from 0.5 to 10 μm , and an addition amount of the white pigment and the luster pigment contained in the resin coating film is from 1 to 25% in total:

(5) a color tone of the resin coated metal sheet with addition of a white pigment and a luster pigment can satisfy an L value from 44.0 to 60.0 as measured by a color difference meter (SZS-Σ90) manufactured by Nippon Denshoku Industries Co., Ltd.

17. The resin coated metal sheet according to claim 1, which can satisfy the following (1) or (2) and satisfy the following (3) to (5):

(1) a first surface of the metal sheet is coated with the magnetic coating film, the magnetic coating film selectively contains black additives and, in a case where the magnetic coating film contains the black additives, a resin coating film containing at least one of a white pigment and a luster pigment is further coated selectively,

the second surface on a side opposite to the first surface is coated with a black heat releasing coating film of 1 μm or more containing 1% or more of black additives, and a resin coating film containing at least one of a white pigment and a luster pigment:

(2) both surfaces of the metal sheets are coated each with

the magnetic coating film,

the magnetic coating film at the first surface of the metal sheet selectively contains 1% or more of heat releasing additives,

the magnetic coating film at the second surface on a side opposite to the first surface is a black heat releasing magnetic coating film of 1 μm or more containing 1% or more of black additives, and

at least the black heat releasing coating film of them is coated with a resin coating film containing at least one of a white pigment and a luster pigment:

(3) an integrated emissivity of infrared rays (wavelength: 4.5 to 15.4 μm) when heating the resin coated metal sheet to 100°C can satisfy the following formulae (2) and (3):

$$b \leq 0.9 (a-0.05) \quad \text{formula (2)}$$

$$(a-0.05) \times (b-0.05) \geq 0.08 \quad \text{formula (3)}$$

a: integrated infrared ray emissivity at the second surface of the resin coated metal sheet.

b: integrated infrared ray emissivity at the first surface of the resin coated metal sheet:

(4) a thickness of each of the resin coating film is from 0.5 to 10 μm , and an addition amount of the white pigment and the luster pigment contained in the resin coating film is from 1 to 25% in total:

(5) a color tone of the resin coated metal sheet with

addition of a white pigment and a luster pigment can satisfy an L value from 44.0 to 60.0 as measured by a color difference meter (SZS-Σ90) manufactured by Nippon Denshoku Industries Co., Ltd.

18. The resin coated metal sheet according to claim 16, wherein at least one of the white pigment and the luster pigment contained in the resin coating film is an oxide pigment.

19. The resin coated metal sheet according to claim 16, wherein at least one of the white pigment and the luster pigment contains titanium oxide.

20. The resin coated metal sheet according to claim 17, wherein at least one of the white pigment and the luster pigment contained in the resin coating film is an oxide pigment.

21. The resin coated metal sheet according to claim 17, wherein at least one of the white pigment and the luster pigment contains titanium oxide.